

CD FY10 Budget and Tactical Plan Review

FY10 Tactical Plans for
Scientific Computing Facilities /
General Physics Computing Facility
(GPCF)

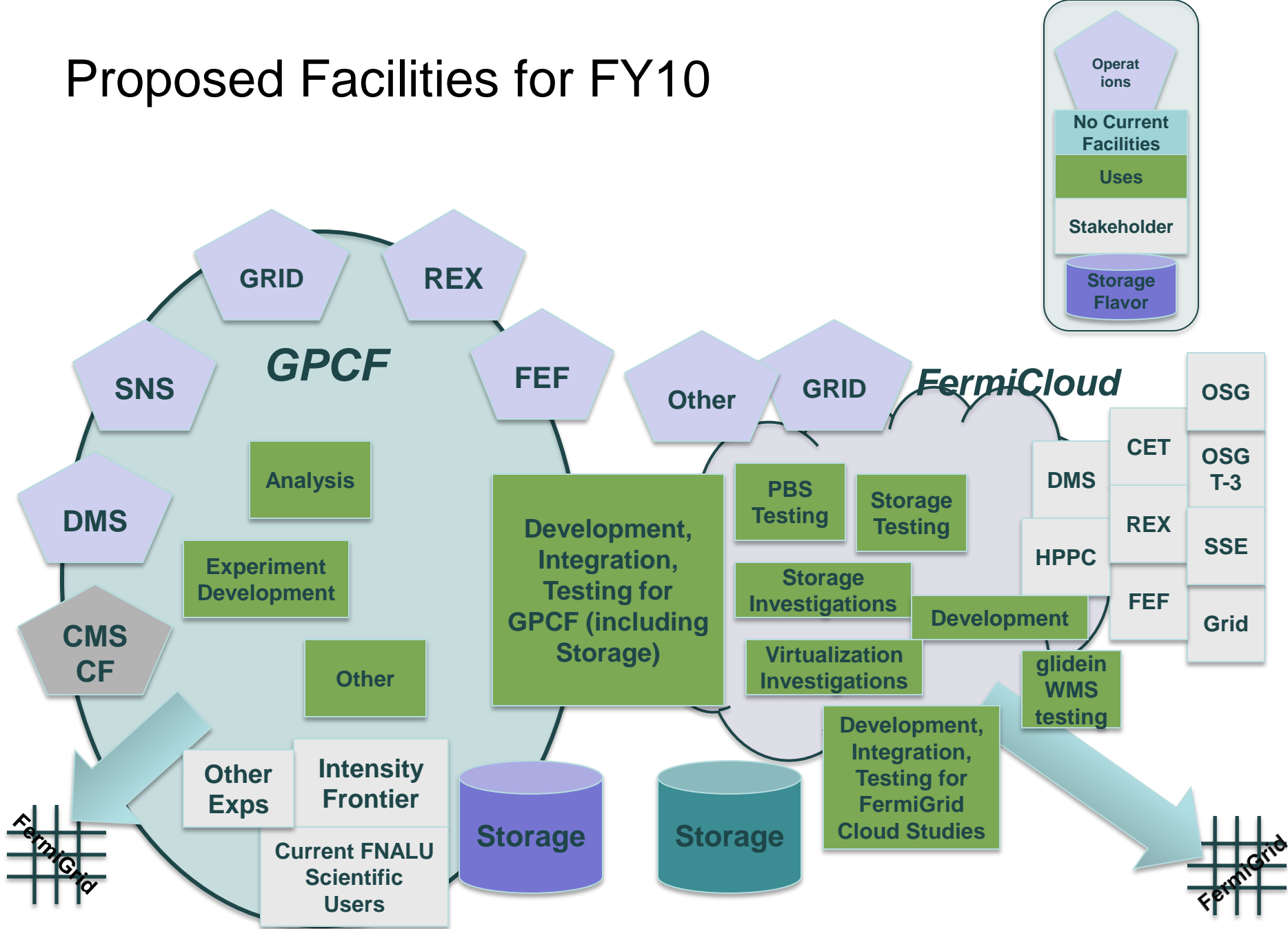
FY10 Tactical Plan for GPCF	CD DocDB # 3329
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Stu Fuess
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What is the GPCF?

- Task force charged 7/25/09 to develop a facility to meet computing needs of Intensity and Cosmic Frontier programs
 - Collect requirements (largely following NuComp work)
 - Architect a system
 - Plan for acquisition and installation in FY10
 - Evolve current facilities into GPCF
 - Replace similar functions from FNALU
- Being done with “borrowed” effort from 5 departments
- Design is not yet done, so crude M&S estimates at this time

Proposed Facilities for FY10



Guiding principles for the GPCF



- Use virtualization
- Training ground and gateway to the Grid
- No undue complexity – user and admin friendly
- Model after the CMS LPC where sensible
- Expect to support / partition the GPCF for multiple user groups

Components of the GPCF

- Interactive Nodes
 - VMs dedicated to user groups, plus “fnalu” general VMs
- Local Batch Nodes
 - VMs of sufficient number for job testing, leading to eventual Grid submissions
- Server / Service Nodes
 - VM homes for group-specific or system services
- Storage
 - BlueArc, dCache, or otherwise (Lustre, HDFS?)
- Network infrastructure
 - Work with LAN to make sure adequate resources

FY10 Tactical Plan for *SCF/GPCF*

- Tactical Plan Leaders: *Stu Fuess, Eileen Berman*

Service Activity List

- SCF/GPCF/Operations
- SCF/GPCF/Support

Project Activity List

- *SCF/GPCF/Management*
- *SCF/GPCF/Integration and Development*

GPCF is a new activity tree. Will describe *Management* and *Integration and Development* as the precursors to the service activities.

Project Activity: *SCF/GPCF/Management*

- Goals Related to this Activity [from Tactical Plan]
 - Specify GPCF architecture and design
 - Task force project
 - New goal, high priority – other work follows
 - Determine GPCF governance
 - How do we run a facility with many contributors?
 - New goal, high priority
- Key Milestones
 - Oct '09 : WBS
 - Tasks for Integration and Development listed and assigned
 - Oct '09 : FNALU Transition Plan
 - Agreement with CSI on split of responsibilities
 - User town meeting
- Project Documentation: DocDB # 3453 (for all SCF/GPCF activities)
- Issues and Risks (specific to this activity, includes allocation impact)
 1. Design is largely “management” because of level of people involved in early phases of project. Difficulty in getting task force together and converging slows design progress.
 2. Multiple possible architecture choices may lead to excessive debate, delaying implementation.
 3. October is busy month!

Project Activity: *SCF/GPCF/Integration and Development*

- Goals Related to this Activity [from Tactical Plan]
 - Provide a robust, stable and secure general facility to enable proper data management and analysis for the intensity and cosmic frontier program.
 - Subsume similar functionality currently offered on FNALU
- Key Milestones
 - Nov '09 : Operational Facility
 - Embryonic interactive, batch, and storage functionality
 - High impact for Nova
 - Nov '09 : Monitoring Infrastructure
 - At level of Run2 facilities
 - Spring '10 : Phase 2 upgrades
 - Additional functionality and capacity
- Issues and Risks (specific to this activity, includes allocation impact)
 1. Procurement schedule dependent upon design completion
 2. Delay in procurement will lead to delay in operation.
 3. Aggressive schedule

Implication is that we may not get it exactly correct the first time, hence “Phase 2”

Ripple Effect on Shared IT Services

Activity Level 2	FermiCloud (GRID)	<--	Storage (NVS, DMS)	<--	Network, Facilities	<--
Development & Integration	Development platform	ATP				
			BlueArc	NMS		
			dCache	NMS		
					Ports	NMS
					Location?	NTS

- FermiCloud development platform will support the GPCF reliance on VMs
- Storage distributed among BlueArc, dCache, and local disks
- Will need additional network ports
- GPCF physical location is TBD

FY10 FTE and M&S: Request vs. Allocation

Level 0/1 Activity: *SCF/GPCF*

Activity Level 2	Project or Service	Project Priority	FY10 FTE Request At Activity Level 2	FY10 M&S Request At Activity Level 2	FY10 FTE Allocation At Activity Level 2	FY10 M&S Allocation At Activity Level 2
Management	Project	High	0.45			
Integration & Development	Project	High	0.20	\$286,600		
Operations	Service	High	0.25			
Support	Service	High				
Total			0.90	\$286,600		

- Details of SWF...
 - Tactical Plan calls for total of 2.1 FTE-year, but BLIs have been entered assuming SWF contribution within various department activities.
Expected (see):
 - .3 FTE from DMS (.025 MC, .02 GO, .25 MB)
 - .5 FTE from GRID (.1 EB, .2 GG)
 - .5 FTE from REX (-)
 - .5 FTE from FEF (-)
 - .3 FTE from SCF Quadrant (.3 SF)
- Working out how to budget GPCF effort among departments*

FY10 FTE and M&S: Request vs. Allocation

Level 0/1 Activity: *SCF/GPCF*

- Details of M&S

Qty	Description	Unit Cost	Extended Cost	Fund Type
16	Interactive Nodes	\$3,300	\$52,800	EQ
32	Local Batch Nodes	\$3,100	\$99,200	EQ
4	Application Servers	\$3,900	\$15,600	EQ
3	Disk Storage	\$22,000	\$66,000	EQ
1	Storage Network	\$10,000	\$10,000	EQ
1	Network Infrastructure	\$40,000	\$40,000	EQ
1	Racks, PDUs, etc	\$3,000	\$3,000	EQ

Impact of Preliminary Allocation

- Current M&S request is for approximately 2x the requests compiled by the NuComp task force
 - Probably not a bad assumption that they underestimated
- Some extra capacity allows variation and trial in development phase
 - But FermiCloud, if it exists, can provide some of this functionality
- Some redundancy with BlueArc requests in NVS worksheets – need to resolve this

Scaling M&S node allocation back is acceptable if development flexibility is provided via FermiCloud

Scaling M&S disk allocation back is acceptable once overlap of BlueArc requests is understood

Summary of Past Action Items

For the record... There are past action items which will be partially addressed by the GPCF

- **CDACTIONITEM-210**

- How are running non-neutrino, non-collider experiments handled?

- **CDACTIONITEM-154**

- Review mission and need for FNALU, including known critical roles and apps

Tactical Plan Summary

- GPCF is a new computing facility addressing the needs of the “small” experiments and the general scientific community
 - It is constructed of VMs
 - Storage, and the requirements generated by the usage patterns, is the most difficult part of the design
- It is currently in the design phase, so budget estimates are somewhat rough
- We see an early implementation phase as soon as M&S funds are available, followed by a Spring upgrade phase targeted at broader needs